Metastasis Of C-kit-expressing Prostatic Adenocarcinoma To The Testis: A Case Report

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Abstract

Despite the high incidence of prostatic adenocarcinoma and its ability for wide dissemination, metastatic involvement of testis is a rare occurrence. Herein, we report a 56 year-old man with a history of prostatic adenocarcinoma who presented with metastatic disease to testis. Immunostain showed c-KIT expression in the metastatic tumor.

Introduction

Adenocarcinoma of the prostate is the leading cancer diagnosed in males in the United States, and metastatic prostate cancer is a leading cause of cancer death, second only to lung cancer in terms of cancer-related mortality. Despite its high incidence, metastasis of prostate adenocarcinoma to the testes is rare, with only approximately 200 cases reported in the English literature (1-3). We report a case of a 56 year-old man with a history of high-grade prostatic adenocarcinoma who had metastatic disease to testis. By immunohistochemistry, the tumor cells are positive for c-KIT.

It has been reported that c-KIT positive prostate carcinoma is associated with high risk of relapse (4). Immunostain for c-KIT of prostatic adenocarcinoma may help better our understanding of which prostatic carcinoma can predispose individuals to become more vulnerable to adverse outcome.

Case Report(s)

The patient was a 56 year-old man who was admitted for evaluation of right testicular mass. His past medical history included the initial diagnosis of metastatic adenocarcinoma in the bone and abdominal lymph nodes consistent with high grade prostate adenocarcinoma primary (Gleason scores 5+4). He subsequently underwent anti-androgen therapy for metastatic prostate cancer. Twenty months after the initial diagnosis, he presented with a right testicular mass. CT scan showed an enlarged right testicle suspicious for neoplasm. Laboratory studies revealed increased prostate specific antigen (PSA) of 67 ng/ml (reference range 0-4 ng/ml) and normal b-HCG (human chorionic gonadotropin) and a-fetoprotein (AFP) levels.

A right radical orchiectomy was performed. Grossly, a 6.5 cm tan-golden, homogeneous, white and firm mass was identified in the testis (Figure 1A). Histologically, the mass is composed of tumor cells arranged in a glandular pattern with extensive nuclear atypia characterized by nuclear hyperchromasia and prominent nucleoli (Figure 1B-D). Scattered tumor cell infiltration in epididymis and spermatic cord soft tissue is also identified. Strikingly, besides immunoreactivity for PSA, pancytokeratin, AE1/AE3 and polyclonal carcinoembryonic antigen, the tumor cells also show intense membrane staining for c-KIT (CD117) (Figure 2A-E). In addition, the neoplastic cells express synaptophysin, but are negative for cytokeratin 7, cytokeratin 20, vimentin, placental alkaline phosphatase and inhibin (Figure 2F-H). These findings are consistent with metastatic prostatic adenocarcinoma with neuroendocrine differentiation.

Discussion

Metastatic carcinoma of the prostate to the testis is considered as advanced disease and is usually accompanied by multiple organ metastases. To our knowledge, this is the first report of c-KIT expression in prostate adenocarcinoma metastatic to the testis. The tyrosine kinase receptor c-kit exerts a broad range of biological activities during organogenesis and normal cell development. Numerous studies revealed that altered c-kit levels occur in a variety of malignancies (5). Previous studies also demonstrated a trend to a higher risk of relapse among the c-kit positive samples series of prostate cancer patients (4). The expression of a truncated form (tr-KIT) tyrosine kinase receptor has been found in 66% of high-grade prostatic adenocarcinomas (6).

Our study is only an initial experience and it is necessary to consider a higher number of patients to clarify whether c-kit is really an independent predictor for disease recurrence and/or metastasis. Further study in this area will also help to understand whether anti c-KIT drugs could become an effective complement to the armamentarium of prostate cancer therapies.
Conclusion

Prostate adenocarcinoma metastatic to testis is a rare event that may aberrantly express c-KIT. Molecular characterization of c-KIT expression in prostatic adenocarcinoma may help shed light on tumor progression.

References

Illustrations

Illustration 1

Figure 1. Gross and histopathological features of metastatic prostatic adenocarcinoma. A) A tan-golden homogeneous cut surface was microscopically (B-D) found to be composed of sheets of neoplastic cells with abortive gland formation. The neoplastic cells show nuclear hyperchromasia, and prominent nucleoli (D).

Illustration 2

Figure 2. Immunophenotyping of the lesion reveals positive immunoreactivity for PSA (A), c-KIT (B & C), pancytokeratin (D), CEA (E), and synaptophysin (F) and negative for PLAP (G) and inhibit (H). PSA, prostate-specific antigen; AE1/AE3, pancytokeratin; CEA, carcinoembryonic antigen; SYN, synaptophysin; INH inhibit.
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